Natural gas

Discharge pressure - 1500 psi , 103.42 bar

Discharge temperature - 597°F, 314°C

Steam consumption - 21.77 t/h. (3288 bbl / d )

Steam quality - 80%

Thermal efficiency - 88%

Excess - 15%

Exhaust temperature - 250°F

heating surface - 2000 sq.m. foot.

Convection heating surface - 14 684 sq.m. foot

Pressure drop across heater - 300 psi

Relief valves set to 1500 psi and 1545 psi , (103.42 and 106.5 bar)

Pump motor - 125 HP , TEFC High Eff .

Pipe Size - 3" Schedule 80 SA106GR.B

Piston size - 21/8", 1860 psi , 128.3 bar

Electricity - 175 kWh

SPECIFICATION OF THE STEAM GENERATOR

• The conditioned steam generator must be manufactured in full compliance with the ASME Code for Power Boilers, Section I.

• The device must be mounted on skids.

• The steam generator must be of modular design.

“The installation must ensure operation 24 hours a day. It only requires downtime for checks and maintenance.” The installation must operate in manual and automatic control modes;

operating parameters are set in the control panel

The steam generator is designed for continuous operation

FUEL SPECIFICATIONS

• The steam generator must be capable of burning natural gas or propane.

GENERATOR FEEDWATER

• Feedwater supplied by the customer will be treated according to the following specifications:

Total hardness - Less than or equal to 0.2 mg/l as CaCO3

Fe - Less than or equal to 0.5 mg/l

Dissolved 02 - Less than or equal to 0.01 mg/l

pH value - 8-9

Input Temp. Design:

- Normal 70 degrees Fahrenheit

- Minimum 60 degrees Fahrenheit

- Maximum 70 degrees Fahrenheit

Sled CCGT

• Wide flange beams should be used for full radiation and convection bearing capacity.

• Provide appropriate labeling of piping and electrical connections.

BOILER SECTION

• A light, quick-release door should be provided for entry and inspection of the department. The door must be lined with refractory and equipped with a davit for ease of handling.

The radiant tube must be supported in intermediate positions with a full circle, free-slip casting

stainless steel pendants.

• Pipe outlets must be inside the combustion chamber.

• All radiant tubes are removable without dismantling the economizer or burner and components.

• The temperature of the wall of the radiant section steam vent must be monitored by a Type J thermocouple sensor on the vent pipe. The thermocouple is shielded.

• An air-cooled port must be provided in the combustion chamber at the end of the burner.

• The radiant pipes must be located in such a way as to ensure maximum heat absorption from both direct and reflected heating radiation.

• Provide Meriam manometer Series 100, U-shaped, model 10AA25WM, for combustion chamber pressure measurement and direct reading.

• The radiation chamber must be supported by crossbeams spaced as required to ensure the integrity of the wide shelf structure.

• The radiating chamber must be provided with a drain connection.

The radiation chamber must be completely lined with refractory .

Motor:

• Each feed water pump will be equipped with a pulsation damper at the inlet and outlet,

• All pump inlet and outlet lines must be provided with flanges and/or connection pipes to facilitate pump maintenance.

• The feed water pump must be equipped with a safety valve.

bypass feedwater pump discharge line must be fitted with an integral orifice flow meter to control flow from the orifice.

• Local pressure and temperature sensors must be provided prior to the feedwater supply to the convection section.

• Include a DP transmitter in the delivery.

• Feed water pump, inlet and outlet dampeners, bypass valve must be mounted on skids.

• Provide a feed water heater to raise the feed water temperature from 86°F to 250°F before

entrance to the convection section.

STEAM PIPE

• The steam generator is equipped with a Consolidated relief valve or equivalent installed on the

convenient height for access and maintenance. All valves must be manually operated.

• On the discharge line an ANSI check valve and check valve must be installed.

• Discharge piping and valves must be dimensioned to ensure minimum pressure drop.

• The scrubber should be 6" diameter, 80" diameter to provide low enough velocities so that the samples are only the aqueous phase of the mixture. The scrubber should not contain grids, but be provided with shock-proof baffles.

• The sample cooling coil must be provided with pipes, valves and a drain. The drain piping for the cooler includes a viewing window where flows can be observed and simulated. Cooling water piping from feed water line included,

• Discharge pressure and temperature should be displayed on the screen located on the control panel.

Provide local temperature and pressure connections for control system calibration.

• Pressure connections must have shut-off valves. Provide points for installing thermometers on the steam pipeline.

FUEL GAS SYSTEM

• Full pressure adjustment and double shut-off valve must be provided by the main components.

flanges for ease of maintenance and repair. Control valves must be manufactured by Fisher or equivalent and shutoff valves must be manufactured by Maxon or equivalent.

• A motorized valve for safe shutdown and venting must be provided and will be fully

interlocked with the control system.

Provide a fuel gas collector with a burner control valve. When manually blowing off condensate, also provide a valve and pipeline.

• Means of accounting for fuel gas must be included.

AIR COMPRESSOR

• Compressor 43 SCFM, 20 hp , 120 gallon tank

• Compressor on the water purification unit.

• - All pressure gauges and regulators necessary for the operation of the system must be provided on the steam skid of the generator.

- - All connecting lines at the joints of the racks will have socket connections \*

CONTROL SYSTEM

. • The control system must be electrical with full modulating control.

- The electrical system of the generator must comply with all standards.

• ''All generator power must be 460 volts, 3 phase, 60 cycles. Three-phase electrical circuit

switches will be used for main power. Motor circuit fuses ( MCP;s ) will be used in all combination motor starters of size 0 and larger. A fuse switch will be provided in front of all control power transformers. A transformer is provided to reduce the voltage to 120 V.

volt for use with electrical appliances and controls.

• The control console is a free-standing, rain- and dust-proof enclosure with all electrical

controls installed to facilitate control of pressure, temperature and control functions in

one place; The cabinet houses the main circuit breaker, all combined motor starters,

transformers, fuse switches, etc.

• The control console will have a blank design. All vents on the control console will be

Equipped with dust traps to prevent dust ingress.

• A one-shot alarm system will be provided.

• The steam generator is designed for automatic operation and maximum equipment safety.

and staff.

The alarm system has a positive internal component, a self-monitoring function. If a

component failure that could lead to unsafe operation, the system will prevent the device from starting.

The generator will not restart automatically when power is restored after a power failure; however , the postpurge cycle will start automatically after power is restored.

• The unit has a selector switch for start and stop (on/off) and a single point reset button for alarms.

• The built-in push-button alarm test timer for functional testing of all alarms is designed so that it cannot be disabled. Alarms will re-enter the circuit at the end of the test interval automatically if they are reset to start.

• A set of single-pole, two-position relay contacts is provided for connection to a remote alarm.

system for signaling the state of automatic shutdown of the generator. In addition, power management " on-off "

The switch will be equipped with single-pole, double-acting auxiliary contacts to be used in this remote signaling circuit. Wiring to relay contacts and circuit breaker auxiliary contacts will be

connected to the removable terminal block next to the main generator disconnect in

management console.

• The transmitter of the feedwater system will be with a d/p cell.

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Control and display

• Type of solid-state thermocouple; rack mounted on the control panel.

(a) High steam temperature, adjustable setpoints up to a maximum of 800 degrees Fahrenheit and low

adjustable steam temperature set point.

(b) High tube temperature, adjustable setpoints up to a maximum of 800 degrees Fahrenheit.

(c) High stack temperature control and adjustable alarm setpoints.

• The feedwater and fuel management system includes, as a minimum, but not limited to,

next: a controller that sends a 4 to 20 milliamp signal to the feedwater bypass valve.

the process control signal (steam outlet pressure) will be sensed by the steam outlet line at

Underside of the radiant section.

• Next to the control panel for maintenance and operation of hand tools.

Paints must be able to withstand the maximum expected temperatures.

INSULATION:

• Where practicable, exposed hotlines and surfaces will be insulated to

the maximum surface temperature will not exceed 140 degrees. Fahrenheit. Where applicable, hot zones

exceeds 140 degrees. F will be provided with personnel protection. Elements such as feed water

preheater, lines to and from the convection and radiant sections, steam removal pipelines, etc.,

will be insulated.